DS ASSIGNMENT NO: 3

Load Balancing

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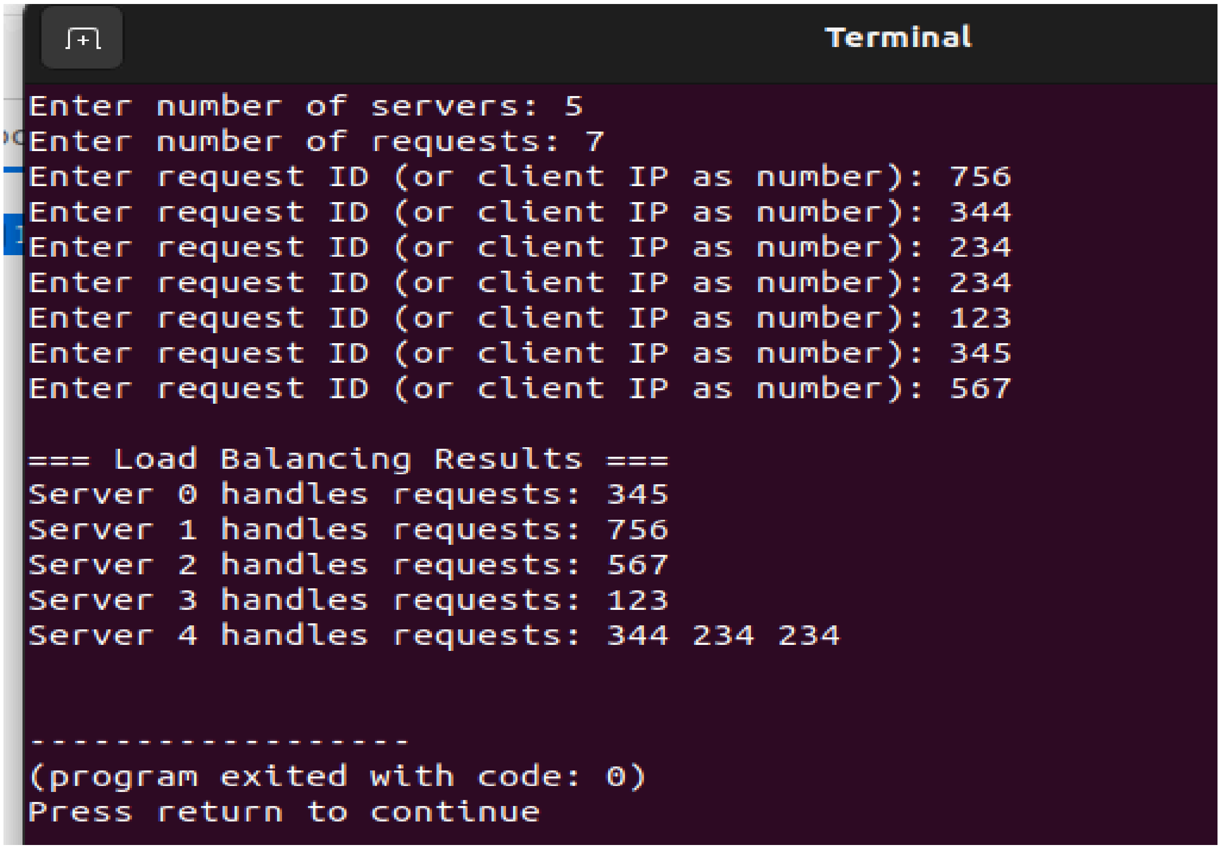
Date:-

CODE

```
#include<iostream>
using namespace std;

int m#include <iostream>
#include <vector>
using namespace std;

int main() {
    int servers;
    cout << "Enter number of servers: ";
    cin >> servers;

    // Vector of vectors to store multiple requests per server
    vector<vector<int>> hash_servers(servers);

    int req;
    cout << "Enter number of requests: ";
    cin >> req;

    vector<int> val(req);

    // Input request IDs
    for (int i = 0; i < req; i++) {
        cout << "Enter request ID (or client IP as number): ";
        cin >> val[i];
    }

    // Assign requests to servers using modulo hash
    for (int j = 0; j < req; j++) {
        int hash_val = val[j] % servers; // server index
        hash_servers[hash_val].push_back(val[j]);
    }
    // Output load distribution
    cout << "\n=== Load Balancing Results ===\n";
    for (int k = 0; k < servers; k++) {
        cout << "Server " << k << " handles requests: ";
        if (hash_servers[k].empty()) {
            cout << "None";
        } else {
            for (int req_id : hash_servers[k]) {
                cout << req_id << " ";
            }
        }
        cout << endl;
    }

    return 0;
}
```

OUTPUT



```
Enter number of servers: 5
Enter number of requests: 7
Enter request ID (or client IP as number): 756
Enter request ID (or client IP as number): 344
Enter request ID (or client IP as number): 234
Enter request ID (or client IP as number): 234
Enter request ID (or client IP as number): 123
Enter request ID (or client IP as number): 345
Enter request ID (or client IP as number): 567

=== Load Balancing Results ===
Server 0 handles requests: 345
Server 1 handles requests: 756
Server 2 handles requests: 567
Server 3 handles requests: 123
Server 4 handles requests: 344 234 234


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(program exited with code: 0)
Press return to continue
```